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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/492,557 01/27/00 ANTHONY

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022879 MM91/0509
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INTELLECTUAL PROPERTY ADMINISTRATION
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EXAMINER

KIELIN, F	
ART UNIT	PAPER NUMBER

2813
DATE MAILED:

7
05/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/492,557

Applicant(s)
Anthony

Examiner
Erik Kielin

Art Unit
2813



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 12, 2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above, claim(s) 16-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

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Specification

1. Claim 11 is objected to because of the following informalities:

in line 3, replace the first occurrence of "the" with --to-- for clarity.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-6, 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by **Hurst et al.** (US 5,956,267).

Hurst discloses the sense layer / tunnel layer / reference layer stack 70 (Fig. 8, column 6, lines 27-42); the structure "keeper" (30 in Figs 6-8; in trench in Figs. 9-13; column 5, lines 27-47) formed of a magnetically permeable ferromagnetic material which (1) prevents disruptions to the magnetization state in the sense layer, and (2) has a shape that provides flux closure: a path for magnetic flux transport between a pair of opposing edge regions of the sense layer. (See Fig. 16; column 7, lines 6-15).

Regarding claim 2, see Fig. 13, column 7, lines 32-47.

Regarding claim 3, see Figs. 15-16, column 7, lines 6-15).

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Regarding claim 15, the easy axis of the ferromagnetic material is inherently perpendicular to the easy axis of the sense layer, as made clear from the aforementioned passage at column 7, lines 6-15).

3. Claims 1-9 and 13-15 rejected under 35 U.S.C. 102(b) as being by **Torok** et al. (US 5,587,943), .

Torok discloses a magnetic memory cell including a sense layer; a “keeper” layer 402 formed of a magnetically permeable ferromagnetic material which (1) prevents disruptions to the magnetization state in the sense layer, and (2) has a shape that provides flux closure: a path for magnetic flux transport between a pair of opposing edge regions of the sense layer. (See Fig. 10, column 12, lines 10-39 -- especially lines 16-19.)

Regarding claims 7-8 both the sense and reference layers are adj the keeper structure.

Regarding claim 9, the thinness of 50 Å of the insulting layer 404 between the keeper structure 402 and the sense layer 412 are inherently exchange coupled. See In re Swinhart, 169 USPQ 226,229 (CCPA 1971) and In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Regarding claim 15, the easy axis of the ferromagnetic material is inherently perpendicular to the easy axis of the sense layer.

4. Claims 1-3, 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by **Daughton** (US 6,168,860 B1).

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Daughton discloses a GMR memory cell comprising alternating "soft" ferromagnetic sense layers and "hard" ferromagnetic layers which prevents disruptions to the magnetization state in the sense layer the sense layers are exchange coupled. (See column 3, lines 30-39.)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hurst**.

The prior art as explained above discloses all of the limitations of claims 1-8 except for indicating whether the reference or the sense layer is adjacent the keeper structure. Given that both the reference and sense layers separated by the tunnel barrier are in the bit line 70 of Hurst (as indicated at column 6, lines 27-42), and that it is not indicated as to which of the permalloy layers is the reference and which is the sense, it is an obvious a matter of design choice as to which layer is closest to the keeper structure. Also given that the specification indicates that it doesn't matter, the instant application provides no evidence of unexpected results for one orientation over the other.

It would have been obvious to one of ordinary skill in the art at the time the invention was made as a matter of design choice to have either the sense layer or the reference layer adjacent the

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keeper structure as the keeper structure would still serve the intended purpose in for either orientation.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pisharody (US 5,039,655) anticipates at least the independent claims of the instant invention (columns 3-5).

Any inquiry concerning this communication from examiner should be directed to Erik Kielin whose telephone number is (703) 306-5980 and e-mail address is erik.kielin@uspto.gov. The examiner can normally be reached by telephone on Monday through Thursday 9:00 AM until 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers, can be reached at (703) 308-2417 or by e-mail at charles.bowers@uspto.gov. The fax phone number for the group is (703) 308-7722 or -7724.

EK



Tuan H. Nguyen
Primary Examiner

May 4, 2001